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# ResearchNews

ALBERTA HERITAGE FOUNDATION FOR MEDICAL RESEARCH

SUMMER 2008

## Mental health *and* addictions

Into the research spotlight

**On the cover**

**Mark Gervais** is an illustrator and animator living in Calgary. He made the transition to Alberta from Saskatchewan to attend the Alberta College of Art and Design in 1994 and began working professionally in 1998. After 7 years as a website designer he decided to make drawing his full-time job and has been wearing down pencils ever since. Over the years Mark has worked for such clients as Dell, *Fast Forward Weekly*, Kellogg's, and *Avenue Magazine*. You can find more of his work at **www.markgervais.com**.


**AHFMR MISSION**

AHFMR supports a community of researchers who generate knowledge, the application of which improves the health and quality of life of Albertans and people throughout the world. AHFMR's long-term commitment is to fund health research based on international standards of excellence and carried out by new and established investigators and researchers in training.

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# Breaking down the walls

Dr. David Goldbloom discusses stigma, treatment "silos", and other barriers faced by those suffering from addiction and mental illness.

STORY BY JANET HARVEY / ILLUSTRATION BY PETER MITCHELL

ADDICTIONS. MENTAL ILLNESS. Most of us think of them as two entirely different things. But in fact, often the conditions go hand in hand. At a conference AHFMR hosted recently, it emerged in discussion that somewhere between 40% and 80% of people diagnosed with a variety of psychiatric disorders may have co-occurring addictions to a range of both legal and illegal substances.

Which is where Dr. David Goldbloom of Toronto's Centre for Addiction and Mental Health (CAMH) comes in. Although he never anticipated a career in this field, Dr. Goldbloom found himself drawn to the complexity of problems he encountered during his psychiatry rotation in medical school. "Psychiatry is a fascinating fusion of biology, psychology, and culture," he explains. "Neuroscience was just starting to heat up as a discipline at that time and contribute a great deal to our understanding of the brain. And I found the patients so very engaging."

Sadly, not all of society shares Dr. Goldbloom's empathy with those patients. Stigma and discrimination remain among the biggest problems faced by those with mental illness. But the veil of secrecy and shame is starting to lift, partly because of the increasing tendency among celebrities and public figures to acknowledge the addiction and mental-health issues they have faced. Singer Natalie Cole wrote a book about her struggles with drug addiction. In Canada, much-loved CBC host Shelagh Rogers has been candid about her experiences with depression.

> "We have seen a gradual lessening of stigma"

"When famous people talk plainly about their experiences, it has a permissive effect on the rest of us to acknowledge these all-too-common human problems as well," says Dr. Goldbloom. "There is a long way to go, but we have seen a gradual lessening of stigma, and an increasing recognition of the enormous cost to society, families, and individuals."

And addiction and mental health, as fields of study, have seen a number of changes over the years in terms of both treatment and research. Traditionally, mental illness and addiction have been studied and treated separately in "silos"—a situation brought about by healthcare providers. This is starting to change nationally and internationally, thanks to more patient-centred approaches which integrate research, treatment, and teaching. The Centre for Addiction and Mental Health has been at the vanguard of this movement.

Now celebrating its tenth anniversary, the Centre was created in 1998, when four institutions merged. The oldest partner was the Queen Street Mental Health Centre—opened in 1850 as the first asylum in Canada for the mentally ill. The other partners were the Clarke Institute of Psychiatry, the academic seat of psychiatry for the University of Toronto and a major research centre; the Addiction Research Foundation, with its international reputation for neurobiology and social-policy research; and the Donwood Institute, Canada's first publicly funded hospital for addictions. The merger brought together academic research and front-line clinical care in addiction and mental illness.

Treatment of patients with both addiction and mental illness remains a very difficult challenge. Those with symptoms of severe mental illness are likely to receive treatment for that illness; for a variety of reasons, however, they are unlikely to receive treatment for their addictions as well. Although this situation is changing—partly because of the advent of facilities like the Centre for Addiction and Mental Health—there is still a long way to go. "We're moving in the right direction," says Dr. Goldbloom, "but we're still in motion." ❋

**About the researcher**
**Dr. David Goldbloom** was the first physician-in-chief at the Centre for Addiction and Mental Health in Toronto, and is currently its senior medical advisor for education and public affairs. In fall 2007 he participated in the AHFMR Inukshuk conference "The Brain, Mental Health, and Addiction: From Synapse to Society". He was also recently named one of two vice-chairs of the new Mental Health Commission of Canada, launched by the federal government in September 2007 with a head office in Calgary.

**Recommended websites**
**Centre for Addiction and Mental Health**
www.camh.net

**Mental Health Commission of Canada**
www.mentalhealthcommission.ca

**Further reading**
**AHFMR Inukshuk Conference summary paper: The Brain, Mental Health, and Addiction: From Synapse to Society**
http://www.ahfmr.ab.ca/download.php/d20468c21ac08fcb8f4c7ee1d2b35ac0

# How effective are alternative treatments for the symptoms of menopause?

## An AHFMR-funded project provides some answers

STORY BY CONNIE BRYSON / PHOTO BY TRUDIE LEE

**About this feature**

AHFMR frequently receives letters requesting information about Heritage research or about various medical conditions. "Responding to the reader" is a *Research News* feature intended to provide up-to-date information related to readers' questions, with the help of experts in the Alberta research community. AHFMR cannot provide medical advice, however; please consult your family physician about your specific health concerns.

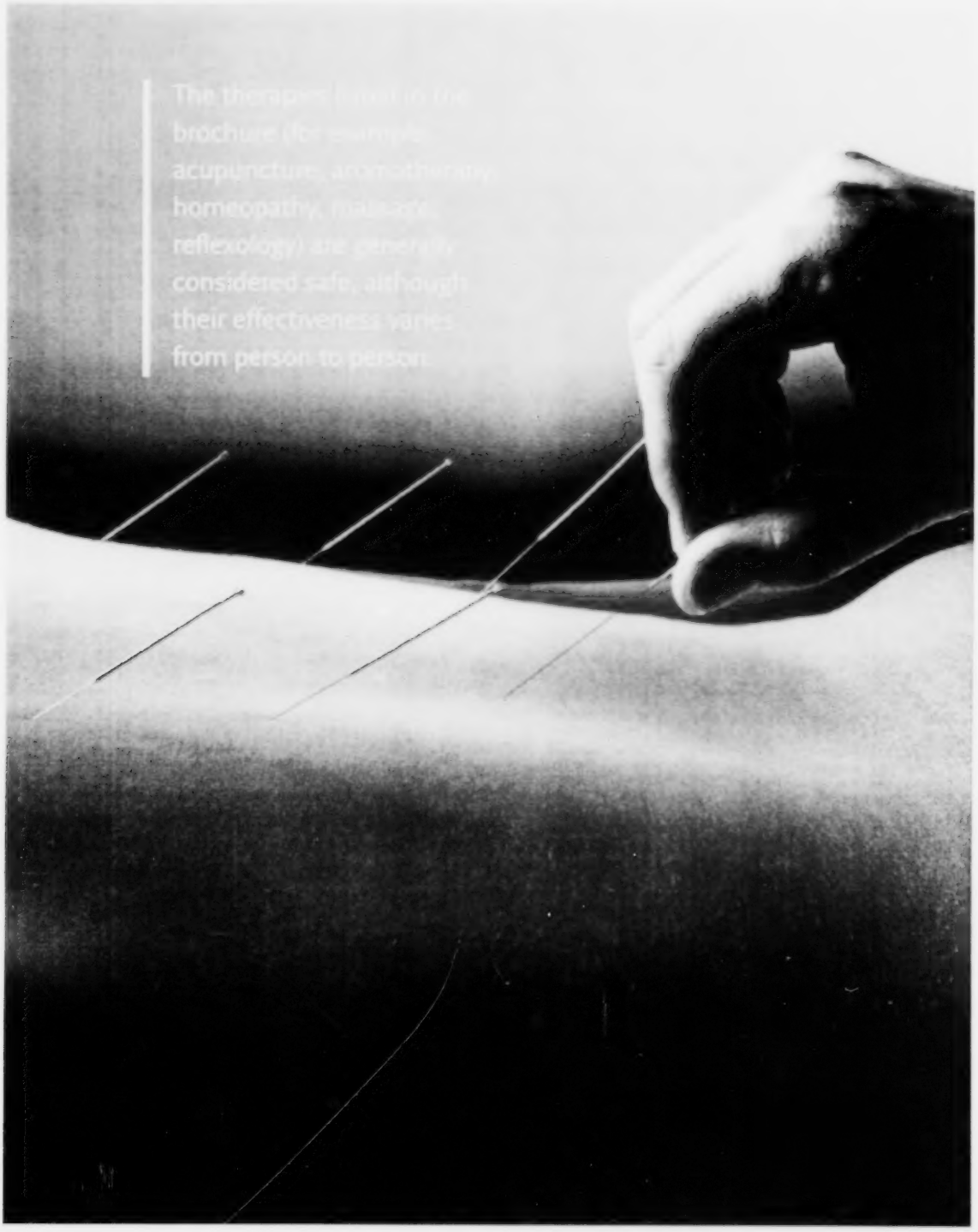
MENOPAUSE is the permanent end of menstruation and fertility. Although it is not an illness, its symptoms (including hot flashes, mood swings, sleep disturbance, and bone loss) can be distressing and disruptive, and often appear long before a woman's final period. Hormone therapy remains the most effective treatment for relieving many of the symptoms, but uncertainty about its risks and benefits has prompted many women to look to complementary and alternative medicine.

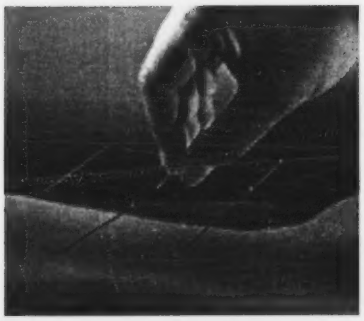
With support from AHFMR, a research team led by Dr. Marja Verhoef undertook a project to help women sort through the sometimes conflicting information about complementary and alternative treatments. The objectives were to assess what information women need about alternative treatment options, and to develop the best strategies for communicating practical and reliable information to them.

The result is a brochure in which the effectiveness of various treatments is evaluated in relation to nine symptoms (see sidebar). The information is organized into three sections which correspond to the three treatment groups: *therapies*, such as acupuncture and paced breathing; herbal or dietary *supplements*, such as herbs and vitamins; and prescription *drugs*, such as hormone therapy.

"The brochure contains solid, unbiased information, but it is not a substitute for professional medical advice," says Kim Polvi, a Calgary-based medical librarian who was a member of the research team. "However, it is a reliable starting point for making decisions. Consumers have to be careful—because a lot of information out there is only aimed at selling you something."

> What information do women need about alternative treatment options?


The therapies listed in the brochure (for example, acupuncture, aromatherapy, homeopathy, massage, reflexology) are generally considered safe, although their effectiveness varies from person to person.



## Symptoms of Menopause

**Below are the nine most common symptoms of menopause. Not everyone will experience all of these symptoms—approximately 30% of women experience no symptoms; others experience symptoms not listed below.**

- bone loss
- lapses of concentration and memory
- hot flashes
- mood swings
- decreased sexual desire
- sleep disturbance
- stress
- urinary incontinence
- vaginal dryness

> "Consumers have to be careful"

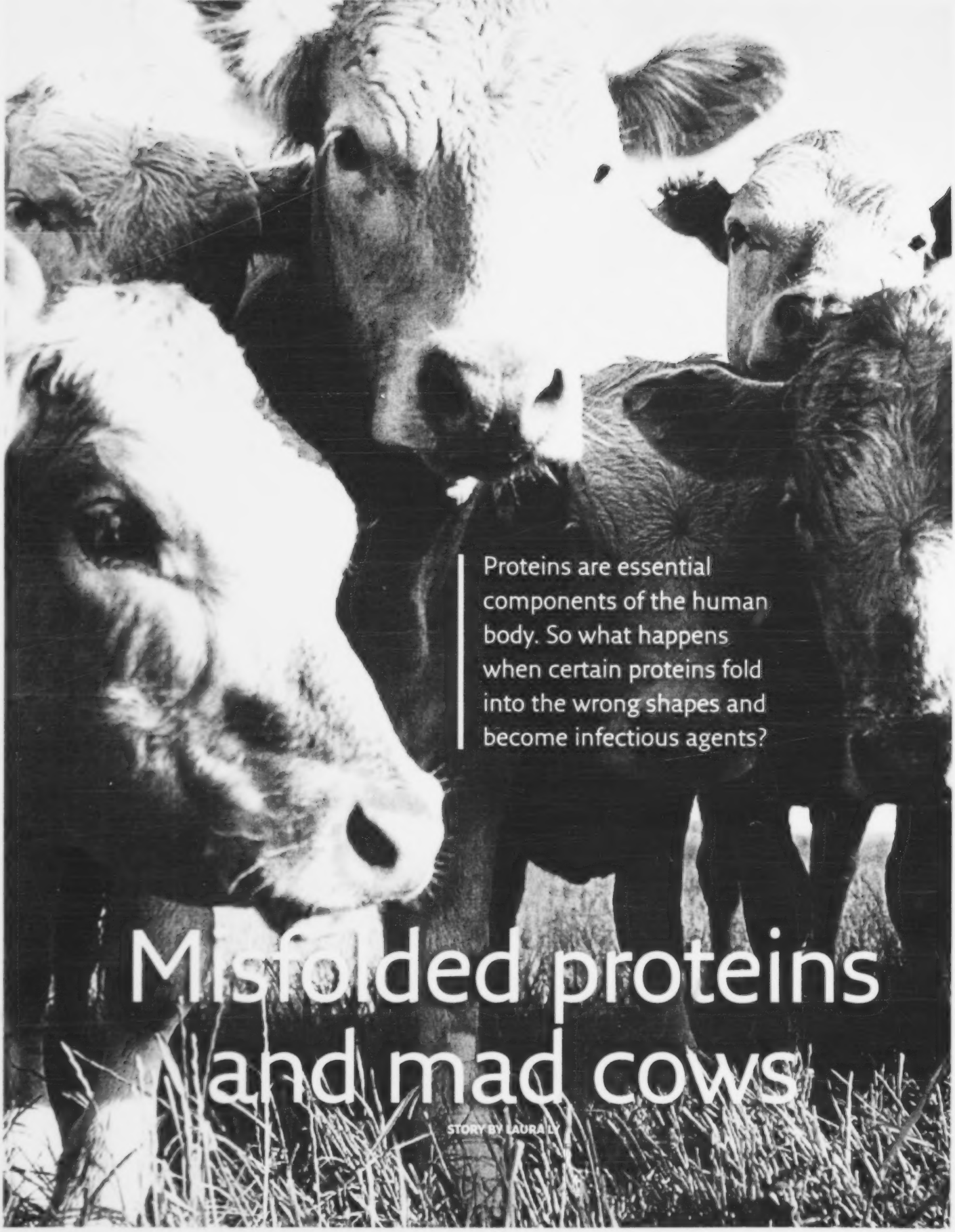
Although some of the complementary and alternative options listed in the brochure have been found to be safe and effective, others have not yet been thoroughly researched. For example, soy is designated with an *E* (for "Effective") as a treatment for bone loss and hot flashes, because there is strong scientific evidence that it alleviates these symptoms; soy contains phytoestrogens, which are estrogen-like chemicals found in some plants. In the listing for a herbal supplement known as St. John's wort, however, there is no *E*, because there is no clear evidence of benefit. The brochure recommends caution with most of the herbal or dietary supplements and all of the prescription drugs. Many can cause side effects, some interact chemically with other supplements or drugs, and a few are just plain toxic.

The therapies listed in the brochure (for example, acupuncture, aromatherapy, homeopathy, massage, reflexology) are generally considered safe, although their effectiveness varies from person to person.

Polvi notes that the brochure only captures information at a particular point in time. "Research on complementary and alternative treatments for menopause is continuing, so new information becomes available on an ongoing basis," she says. "For me, one of the great things about the growing interest in these treatments for all kinds of conditions is that it represents a trend toward self-care. People are taking more responsibility for their own health, and complementary and alternative treatments can play an important role." ❋

**About the researcher**
**Dr. Marja Verhoef** is a full professor in the Department of Community Health Sciences at the University of Calgary. Her research team from the University of Calgary and Calgary Health received support from the ***Health Research Fund***, administered by AHFMR on behalf of Alberta Health and Wellness.

**Recommended website**
**"Complementary and Alternative Therapies for Menopausal Symptoms" brochure**
http://www.managemenopause.healthlearner.com/



Proteins are essential components of the human body. So what happens when certain proteins fold into the wrong shapes and become infectious agents?

# Misfolded proteins and mad cows

STORY BY LAURA L.

In 1982 a scientist by the name of Dr. Stanley Prusiner published a paper suggesting that certain proteins in the brain, which he called "prions", caused certain neurodegenerative diseases. His claim ignited a firestorm of controversy in the scientific community. Scientists believed that a virus could cause degenerative brain diseases; but they were hostile to the idea that a protein could become infectious and do the same. Dr. Prusiner persevered, however, and in 1997 his work was recognized with the Nobel Prize for Medicine. Today, more than a quarter of a century after the original publication, the devastating effects of prion diseases are universally acknowledged.

AHFMR Scientist Dr. David Westaway was involved with that prion research almost from the start. From 1985 onward he worked with Dr. Prusiner on the first experiments to establish the molecular biology of the prion. Now he investigates how prions cause such brain disorders as Creutzfeldt-Jakob disease, chronic wasting disease, and bovine spongiform encephalopathy—also known as BSE or "mad cow disease"—an infection especially relevant to Alberta's beef industry.

Proteins play a role in the structure, function, and regulation of the body's cells, tissues, and organs. "Protein molecules are like the verbs in a sentence—they carry out the actions," explains Dr. Westaway. All protein molecules fold into three-dimensional shapes; but when they change into the wrong shapes (a process known as *misfolding*), they can cause brain diseases. Prions are a special type of brain protein that are normally harmless, but once they fold abnormally, they become infectious from host to host, and across species. The diseased proteins then clump together, slowly infecting and destroying the brain.

BSE is an infection especially relevant to Alberta's beef industry

Dr. Westaway and his team recently discovered another brain protein in the same family. The *Shadoo* protein is a "cousin" of the normal protein, and is found in significant quantities in the adult brain. However, Dr. Westaway observed that as the prion infection increases and the host gets sick, the Shadoo protein begins to disappear. "We now know that the disappearance of the Shadoo protein has to do exclusively with the accumulation of the infectious form. It was an unexpected finding, and it's something we are eager to understand in greater depth."

Alzheimer's disease, a non-infectious protein folding disease of a type that also includes Parkinson's, is another area of research for Dr. Westaway. He and his team focus their attention on the accumulation of a particular *peptide* (a miniprotein) believed to cause the disease. Through study of the peptide, Dr. Westaway hopes to understand the chain of chemical events that causes Alzheimer's and, in the wake of that understanding, develop potential treatments.

A molecular biologist by training, Dr. Westaway was recruited to Edmonton from the University of Toronto in 2006. "The resources within Alberta were a perfect match for us to pursue prion research on an international level," he says. "There was a good, open-minded collegial atmosphere on the university campus that made it an attractive prospect."

Dr. Westaway is the director of the newly established Centre for Prions and Protein Folding Diseases at the University of Alberta. Here he hopes to develop different types of preventive strategies for prion folding diseases; in particular, mad cow disease. He notes, "Our primary goal is to understand how a normal brain protein ends up in the wrong shape, what we can do to prevent that, to diagnose that, and to understand how that can happen spontaneously in brain cells." ❋

**About the researcher**

**Dr. David Westaway**, an *AHFMR Scientist*, is a professor in the Division of Neurology, part of the Faculty of Medicine and Dentistry at the University of Alberta, and the director of the Centre for Prions and Protein Folding Diseases.

**Selected publication**

Watts JC, Drisaldi B, Ng V, Yang J, Strome B, Horne P, Sy M-S, Yoong L, Young R, Mastrangelo P, Bergeron C, Fraser PE, Carlson GA, Mount HTJ, Schmitt-Ulms G, Westaway D. The CNS glycoprotein Shadoo has $PrP^{C}$-like protective properties and displays reduced levels in prion infections. *The EMBO Journal*. 2007;26(17):4038-4050.

**Recommended websites**

**Centre for Prions and Protein Folding Diseases**
http://www.prioncentre.ca/

**The Alberta Prion Research Institute**
http://www.prioninstitute.ca/

# Mental health *and* addictions

STORY BY CONNIE BRYSON / ILLUSTRATIONS BY MARK GERVAIS

Diseases that threaten our physical health tend to be the ones that make the headlines. Yet most of us recognize intuitively that our mental health is just as important to our well-being.

**An estimated one in three Canadians experiences a mental-health problem at some point in life.** Mental illness is estimated to cost the Canadian economy more than $33 billion annually. Worldwide, tobacco and alcohol are among the leading causes of disease and disability. In addition, the physical illnesses associated with addiction to tobacco, alcohol, and illicit drugs cost Canadians about $40 billion annually. Long-term tobacco use, for example, is a risk factor in 6 of the 8 leading causes of death.

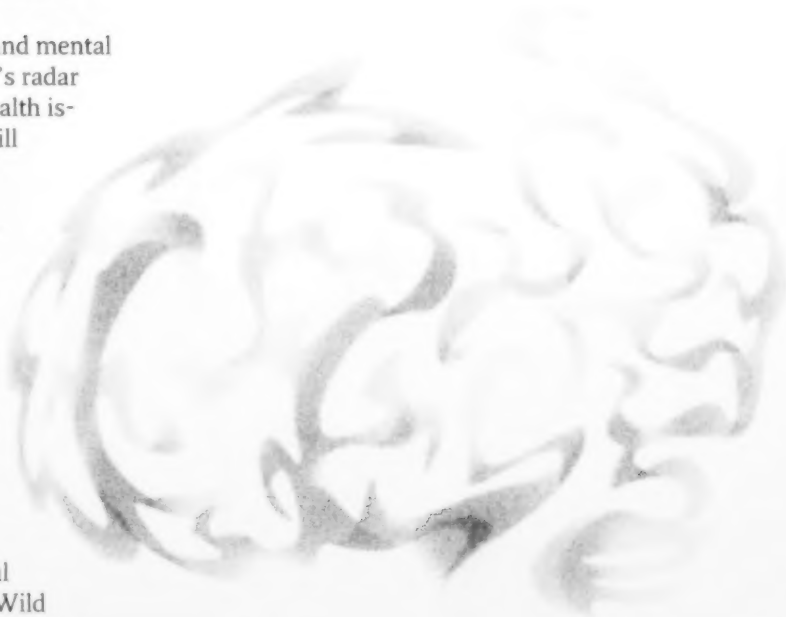
■ "Despite the heavy burden of addictions and mental illness on our society we have a shockingly low level of research, policy, intervention, and programming devoted to these issues," says AHFMR Health Scholar Dr. Cameron Wild, director of the Addiction and Mental Health Research Laboratory at

**"Addictions and mental illness have slipped under most people's radar"**

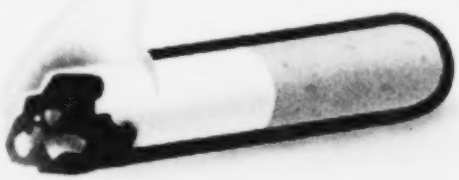
the University of Alberta. "Addictions and mental illness have slipped under most people's radar because of the perception that other health issues are more pressing. And there is still a tremendous amount of social stigma around addictions and mental illness. These factors have contributed to their generally low profile in public opinion and in healthcare systems. But this is changing, albeit slowly. Advocacy groups are putting these issues in the spotlight—and governments, social agencies, and research-funders are responding."

As its name suggests, the Addiction and Mental Health Research Laboratory (AMHRL) is founded on the principle that addictions and mental health should be studied together. Dr. Wild refers to addictions as "a crossroads of familiar diseases and social and economic problems." For example, tobacco use is a primary risk factor for cancers and cardiovascular diseases. Long-term heavy consumption of alcohol is associated with cirrhosis of the liver; short-term binge drinking creates social disruption in such forms as drunk driving and violence. Injection-drug use is linked to transmission of infectious disease. Emerging evidence shows that there may be considerable overlap in the brain systems that underlie addictions and other mental-health disorders.

Another of the lab's principles is that individual, clinical, and population perspectives should be linked. "It's essential to approach addictions and mental-health issues not only from the point of view of the next client who comes through the clinic door, or the next person who might run into problems in school or on the job," says Dr. Wild. "There are important cultural, social, and economic influences on these conditions, and we need to look at these too. To do justice to the complexity of addictions and mental health, you have to use both perspectives—individual and population—and integrate them with other health issues."



Addictions and mental health should be studied together



Research at the AMHRL shows that simple, low-cost interventions can have a big impact on addictive behaviour. One study demonstrated that mailing information on alcohol self-help and assessment to drinkers who expressed interest in looking at such materials can reduce rates of binge drinking by 10%.

Another example is a program the lab developed five years ago in collaboration with Dr. Barry Finegan at the University of Alberta to stop smoking on hospital grounds. Prior to the province-wide ban on smoking in public places, hospitals in Alberta instituted their own smoking bans. Supported by Capital Health, the AMHRL worked with Dr. Finegan and Edmonton-area hospitals to provide information on stopping smoking and offer nicotine patches to smokers affected by the ban.

"The thinking is that if we ban smoking, that's surely going to help people's health," says Dr. Wild. "While this is true at one level, the reality is that 25% or more of people going into hospital for surgery are smokers. They are forced to quit for the time they're in hospital, and some are required to quit for a certain length of time after surgery. What support does the healthcare system provide for them?"

Dr. Wild and his team saw an opportunity to complement the ban with a service. Now, five years later, nurses in pre-surgery clinics in Edmonton deliver self-help materials and "the patch", if requested, to patients who are smokers. To date, this "Reduce My Risk" program has reached thousands of hospitalized smokers who would never have received any support to stop smoking otherwise.

"Policy is one thing; effective implementation is another. It means taking into account the realities of people's lives," explains Dr. Wild. "In this case, there are large numbers of smokers in hospital, and they need some assistance in dealing with smoking restrictions. This kind of easily accessible, straightforward intervention is the key to reaching large numbers of people."

Dr. Wild thinks that Alberta-wide research efforts could do even more to develop and deliver effective interventions for a variety of addictive behaviours. "In Alberta, we have a handful of outstanding researchers looking at these issues. But there's no network. I would like to see our lab as part of a regional centre of excellence for addictions and mental-health research, so that we are doing things on a province-wide scale, not just within our own region. The need is there."

*Quick Facts*

**What is an intervention?**

An intervention is a set of materials, a program, a treatment, or a policy that is designed to have a positive impact on health outcomes.

**About the researcher**

*AHFMR Health Scholar* **Dr. Cameron Wild** is a full professor in the Centre for Health Promotion Studies, at the University of Alberta School of Public Health. He is the director of the Addiction and Mental Health Research Laboratory.

**Selected publication**

Wild TC, Cunningham JA, Roberts AB. Controlled study of brief personalized assessment-feedback for drinkers interested in self-help. *Addiction*. 2007 Feb;102(2):241-250(10).

**Recommended website**

**Addiction and Mental Health Research Laboratory**

www.amhrl.med.ualberta.ca

# Focus on depression

At the University of Calgary, AHFMR Health Scholar Dr. Scott Patten's research activities lie within the discipline called *psychiatric epidemiology*. This relatively young field involves studying the distribution of mental illnesses in large groups of people in order to better understand the conditions. Dr. Patten's particular interest is the epidemiology of depression and its association with a variety of chronic medical conditions. "The fact that depression is associated with other illness is only a crude piece of information," he explains. "The association could mean that illness causes depression, that depression causes illness, or that one affects the prognosis of the other. So while the association is interesting, it's not particularly informative. We need to know more."

*Quick Facts*

**What is epidemiology?**
Epidemiology is the study of how often diseases occur in different groups of people and why. Epidemiological studies can identify risk factors for disease and determine which treatments work best. Because epidemiological observations relate to groups of people, they are different from clinical observations, which determine decisions about individuals.

■ One side of this association seems intuitive: that sickness could contribute to depression. The other side—that depression can increase the risk for chronic medical conditions—is not so obvious. This is where Dr. Patten's research has come up with some surprising results. His team found that depression has a strong impact on the risk or onset of various chronic medical conditions including heart disease, high blood pressure, chronic lung dise. migraine, arthritis, and chronic back pain. In other words, people with depression have a higher risk of developing certain diseases that they did not have before. For some conditions—including high blood pressure, heart disease, and migraine—the risk doubles. No link was found between depression and thyroid disease, peptic ulcers, cataracts, or glaucoma. Dr. Patten notes that there appears to be a pattern linking depression with conditions involving inflammation and chronic pain.

"The idea that depression could affect disease risk is very new"

"The idea that depression could affect disease risk is very new. There's very little literature about it," says Dr. Patten. "If we can understand this more fully, there are important implications for the treatment of a variety of diseases."

For example, research has shown that depression increases the risk for type 2 diabetes. But the converse is not true: type 2 diabetes does not affect the risk of depression. Dr. Patten says this likely means that people who are struggling with depression are going to need new types of assistance to ensure they

address such risk factors for diabetes as lack of exercise, overweight and obesity, and smoking. The situation is different for people with multiple sclerosis, where the disease itself plays a big role in increasing the risk of depression. These people will require specialized mental-health services.

"We're just starting to unravel the complexities that link mental and physical illness," says Dr. Patten. "I'd like to see a more holistic view of healthcare, so that the mental-health domain fits better with the non-psychiatric medical system in a way that would best help people. The mental-health field has to work harder to prevent related health problems."

**About the researcher**

*AHFMR Health Scholar* **Dr. Scott Patten** is a full professor in the departments of Community Health Sciences and Psychiatry at the University of Calgary. He is the director of research for the Department of Psychiatry.

**Selected publication**

Patten SB, Beck CA, Williams JVA, Barbui C, Metz LM. Major depression in multiple sclerosis: a population-based perspective. *Neurology*. 2003 Dec 9; 61(11):1524-1527.

**Recommended website**

**Canadian Mental Health Association: Depression**

www.cmha.ca/bins/content_page.asp?cid=3-86-87

## Depression in Canada

**Although the ancient Greeks** debated the link between health and depression, it wasn't until much later—during the 1980s—that epidemiological studies began to reveal the pervasiveness of mood disorders and their association with dysfunction and disability.

"The early studies put mental illness on the map as a priority in healthcare," says Dr. Scott Patten. "They also showed that a lot of people were not getting the treatment they needed. Since then there's been a huge increase in the number of people being treated with medication, particularly for depression. Survey work we've done in Alberta shows that 6% to 7% of Albertans are taking anti-depressants.

"So now the research questions are changing. How well is treatment working? Are too many people on medication? Are they being targeted appropriately? These are the things we need to know."

Informing this debate is a new report on depression in Canada, co-authored by Dr. Patten with Heather Juby from the Research Data Centre Network. "A Profile of Clinical Depression in Canada" is a social report rather than a clinical one, according to the authors. It brings together results from numerous studies to describe the extent of depression in Canada; highlights potential areas for public policy intervention; and suggests directions for future research. *

The Research Data Centre Network is operated by means of a partnership with the Social Sciences and Humanities Research Council (SSHRC), Canadian Institutes of Health Research (CIHR), Statistics Canada, and a consortium of universities across the country.

**Selected publication**

Patten S, Juby H. A profile of clinical depression in Canada. Research Data Centre Network; 2008 Feb. *Research Synthesis Series:* #1. http://www.ciqss.umontreal.ca/rdcsynthesis

# Mental health and the beginning of life

THE BIGGER THE BETTER. While we don't usually apply this to babies, it appears that bigger is in fact better when it comes to birthweight and mental health. A recent study found that low birthweight carries significant risk for depression and anxiety later in life.

■ "The lower the birthweight, the more likely that an individual will suffer from mood disorders over the course of their life," says AHFMR Population Health Investigator Dr. Ian Colman, who led the study as part of his Ph.D. research at the University of Cambridge. He is now a faculty member of the School of Public Health at the University of Alberta. "The results give us a clue to one of the causes of depression. There is something different about people who are depressed, and for some people this difference can be traced back to the beginning of life."

The study used data from one of the longest-running cohort studies in the world. The Medical Research Council National Survey of Health and Development has tracked the health and well-being of more than 5,300 people since they were born in Great Britain in 1946.

**Low birthweight carries significant risk for depression and anxiety**

Being born small isn't necessarily a problem, notes Dr. Colman. But low birthweight can indicate adverse conditions in the womb. When a mother is stressed, blood flow to the uterus is restricted and the fetus gets fewer nutrients for growth. At the same time, stress hormones pass through the placenta to the fetus, where they can affect brain development and the baby's stress response.

Significantly, the researchers also uncovered another factor in a connection between early development and mental health: the age at which children reach developmental milestones. The people with the poorest mental health were, on average, the last children to stand and the last to walk. The people with the best mental health were the first to stand and the first to walk. "This tells us that many people with depression not only have something different about them early in life, it also says those differences have to do with the development of the brain," says Dr. Colman.

"From a public-health point of view, this is very important because it demonstrates that how we treat pregnant mothers really does matter."

Dr. Colman is now extending his work to better understand the links between prenatal stress in the mother and mental illness later in the child's life. Using data from British and Canadian cohorts, he is looking at whether those who are smaller at birth and slower to reach developmental milestones are more likely to become depressed in the face of stressful events such as divorce, job loss, and death in the family.

"There is considerable evidence from animal-based research that [maternal] prenatal stress affects the stress response of offspring. Obviously we can't take pregnant women and put them in stressful situations just to see what happens. My work is a window on what actually happens in human populations in these conditions.

"One of the main things I'm building toward is a theoretical model of the causes of depression through the life course. Many factors influence the causes, progression, and long-term prognosis for depression. I want to tease some of these out."

*Quick Facts*

**What is a cohort study?**

A *cohort* is a group of people who share a common characteristic or experience within a defined period. A birth-cohort study, like Great Britain's Medical Research Council National Survey of Health and Development, tracks people who were born in a particular period or even on a certain day. The advantage of a cohort study is that it is *prospective*—it follows individuals through time and so can reveal factors which might be associated with disease.

**About the researcher**

*AHFMR Population Health Investigator*

**Dr. Ian Colman** is an assistant professor in the Department of Public Health Sciences at the University of Alberta.

**Selected publication**

Colman I, Ploubidis GB, Wadsworth MEJ, Jones PB, Croudace TJ. A longitudinal typology of symptoms of depression and anxiety over the life course. *Biological Psychiatry*. 2007 Dec 1;62(11):1265-1271.

# The sixth vital sign

AHFMR Health Scholar Dr. Linda Carlson envisions a day when "Check their distress level" is heard as frequently as "Check their blood pressure" in cancer centres. "Emotional distress is as much an indicator of a patient's health and well-being as the standard vital signs of temperature, respiration, heart rate, blood pressure, and pain [a recent addition to the list]. We need to recognize this in the care of cancer patients."

■ The concept of emotional distress as the "sixth vital sign" was pioneered by Dr. Carlson's colleague Dr. Barry Bultz. Both Dr. Carlson and Dr. Bultz are clinical psychologists in the Department of Psychosocial Resources at the Tom Baker Cancer Centre in Calgary. Their research and that of others has demonstrated that emotional distress is a significant problem for one-third to one-half of all cancer patients. It is believed that treating emotional distress will benefit not only patients but also their families and the cancer-care system itself. Patients who are distressed demand more time and resources than average from an already overburdened system.

So what is the most effective way to help cancer patients cope with distress? Dr. Carlson is study-

## What is the most effective way to help cancer patients cope with distress?

ing this question by means of a major project in which patients are screened for evidence of distress. Since 2006, first-time patients at the Tom Baker Cancer Centre have been directed to a kiosk to fill out the Personal Well-being Checklist, in which they answer a variety of questions about stress levels, anxiety, depression, sleep, and fatigue, as well as questions about common practical problems such as drug coverage and finances. The questionnaire is used as a screening tool for distress, to identify problem areas. Dr. Carlson's research tests two approaches to acting on this information: computerized and personalized. One approach has a patient receiving a computerized printout that summarizes the individual's screening results and, based on those results, lists resources available within the centre that the patient can call upon for help. The second approach relays the same information in a personal phone call from a trained assistant, who then helps the patient set up appointments if any are requested.

There are already more than 3,000 people in the database, and recruitment will continue until late 2008. Staff contact patients after 3, 6, and 12 months to check on their levels of distress and anxiety, and to find out which recommendations and referrals they pursued. The study also monitors the costs (to the system) incurred by each patient in terms of prescriptions for drugs and visits to doctors. Dr. Carlson expects to have the results, including those from the 12-month follow-up, by late 2009.

"The problem with the current system is that it's hit-and-miss when it comes to dealing with distress," explains Dr. Carlson. "People might get help or they might not. Not everyone is resourceful or has the same access to resources. This is a way of being systematic about it. The idea is that by directing everyone to the appropriate support services at the start, we could avoid some of the problems later on.

"Ideas are changing—we're recognizing that the 'people part' of cancer care is as important as treating the disease itself. I'm proud to say that we in Alberta are leaders in this aspect. This is becoming an even bigger issue as more patients become cancer survivors and more live with cancer as a chronic disease. Neglecting emotional distress creates a gap in care. We're moving to a continuity of cancer care that is holistic, not piecemeal." ❋

**About the researcher**

**Dr. Linda Carlson** is an *AHFMR Health Scholar* and associate professor in the Department of Oncology in the Faculty of Medicine at the University of Calgary. She holds the Enbridge Endowed Research Chair in Psychosocial Oncology.

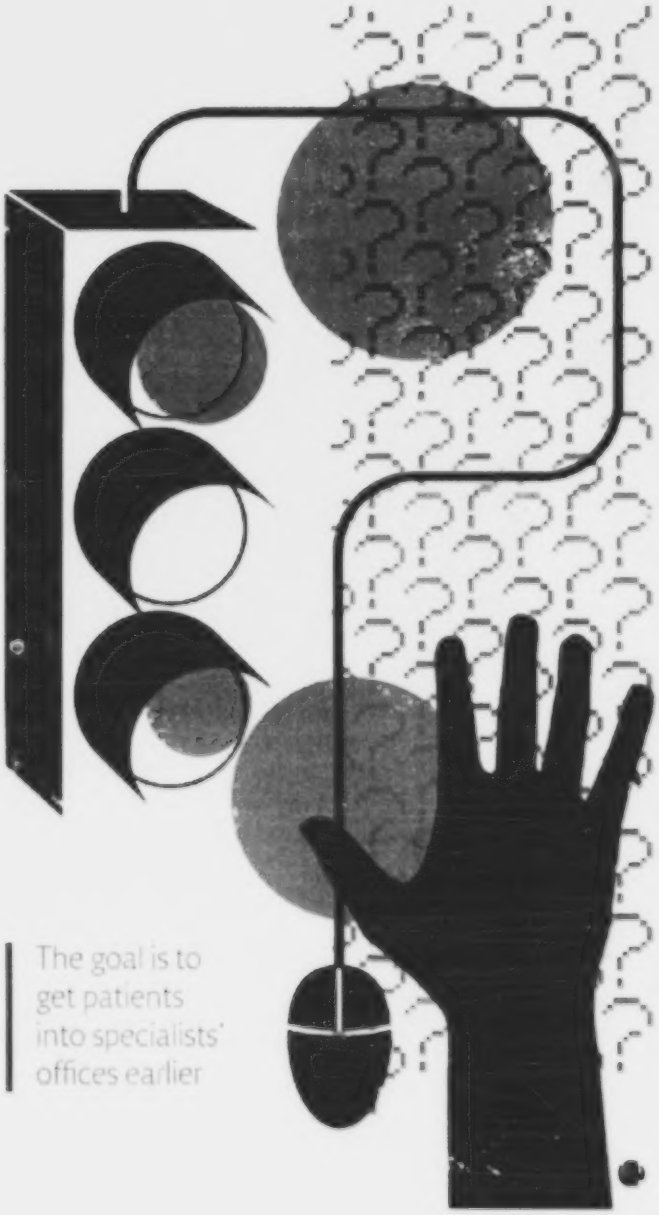
**Selected publication**

Carlson LE, Angen M, Cullum J, Goodey E, Koopmans J, Lamont L, MacRae JH, Martin M, Pelletier G, Robinson J, Simpson JSA, Speca M, Tillotson L, Bultz BD. High levels of untreated distress and fatigue in cancer patients. *British Journal of Cancer*. 2004 Jun 14;90(12): 2297-2304.

# The doctor is in

## A new type of online screening could help rheumatoid arthritis sufferers get treatment sooner.

STORY BY TARA NARWANI / ILLUSTRATION BY WARREN HEISE



The goal is to get patients into specialists' offices earlier

Mention of rheumatoid arthritis conjures up images of gnarled knuckles and twisted feet—joint deformities that can limit one's ability to perform such simple tasks as eating and walking. The disease also significantly reduces life expectancy: rheumatoid arthritis patients die 10 years earlier on average than healthy people, usually as a consequence of heart attack or stroke.

But according to Dr. Walter Maksymowych, AHFMR Scientist and rheumatology professor at the University of Alberta, these dire outcomes aren't inevitable. Drug treatments can help patients manage their disease. The problem is that patients are just not getting the drugs soon enough. "Six to nine months' delay in diagnosis can have a substantial impact on the rate of progression of the disease," he warns. "The more you delay, the worse the outcome." In many patients, doctors can see evidence of irreversible damage to joints in the hands and feet as early as one year after onset of the disease. Using new opportunities in electronic media, Dr. Maksymowych is leading Alberta's efforts to change healthcare delivery for these patients.

Given that the timing of the diagnosis is crucial for the effective treatment of rheumatoid arthritis, what causes the delay? To begin with, there are about 100 different types of *arthritis*, broadly defined as inflammation of joints. Some types are acute, caused by infection or injury. Others are chronic. In *rheumatoid arthritis*, one of the chronic forms, the body's own immune system keeps attacking the joint,

and the associated inflammation persists. Family doctors are faced with the difficult task of distinguishing between these types of arthritis after receiving little training in musculoskeletal medicine at medical school. If family doctors refer patients to rheumatologists for follow-up, waiting lists can be months long.

An additional problem is that many people don't have family doctors. Some seek medical advice—even try to self-diagnose—from Internet sources, often finding misleading information that prevents them from receiving proper diagnosis and treatment.

> Drug treatments can help patients manage rheumatoid arthritis

To overcome these hurdles, Dr. Maksymowych, in partnership with other Alberta rheumatologists, recently launched an online screening tool: www.arthritisdoctor.ca Visitors to the website complete a questionnaire which gives them a score indicating the likelihood that they have rheumatoid arthritis. The goal is to get patients into specialists' offices during the early stages of rheumatoid arthritis.

The questionnaire is currently being tested to ensure that it can identify patients with rheumatoid arthritis accurately. Patients referred to Dr. Maksymowych's clinic are first asked to visit the website and determine their score. This score will then be compared to one the patient receives after a thorough physical examination, in the hope that the assessments match.

A patient's score from www.arthritisdoctor.ca is not a formal diagnosis. Rather, it indicates the urgency with which patients should follow up on their symptoms. The website depicts the score as a light on a traffic signal. "Red means you really ought to go see your doctor, and don't waste any time doing it," Dr. Maksymowych explains. "Amber means that there could be a problem, and although you don't need to go right away, you should probably go. And green? If you're still worried, go see your doctor, but it doesn't seem like there's a problem."

Once the testing is complete at the end of this year, Dr. Makysmowych wants to rank patient scores based on medical need. Patients who receive a "red light" score could be seen in his clinic within two weeks, instead of six months, receiving significantly earlier access to such treatments as the commonly used drug methotrexate that helps control the progression of the disease.

Ultimately, Dr. Maksymowych and his colleagues want to know whether this new system will benefit the patient. "Do those people who come in early because they've used the screening tool see an improvement in terms of joint function and quality of life and their overall long-term assessment?" Medical data on patients who used the screening tool will be compared with the data of those who went through the standard referral process.

Dr. Maksymowych is optimistic. "Better healthcare delivery in terms of access and the availability of effective treatment will, I'm quite certain, eliminate rheumatoid arthritis as a serious disease from our community in about five years." ❋

**About the researcher**
*Heritage Scientist*
**Dr. Walter Maksymowych** is a professor in the Division of Rheumatology, part of the Department of Medicine at the University of Alberta.

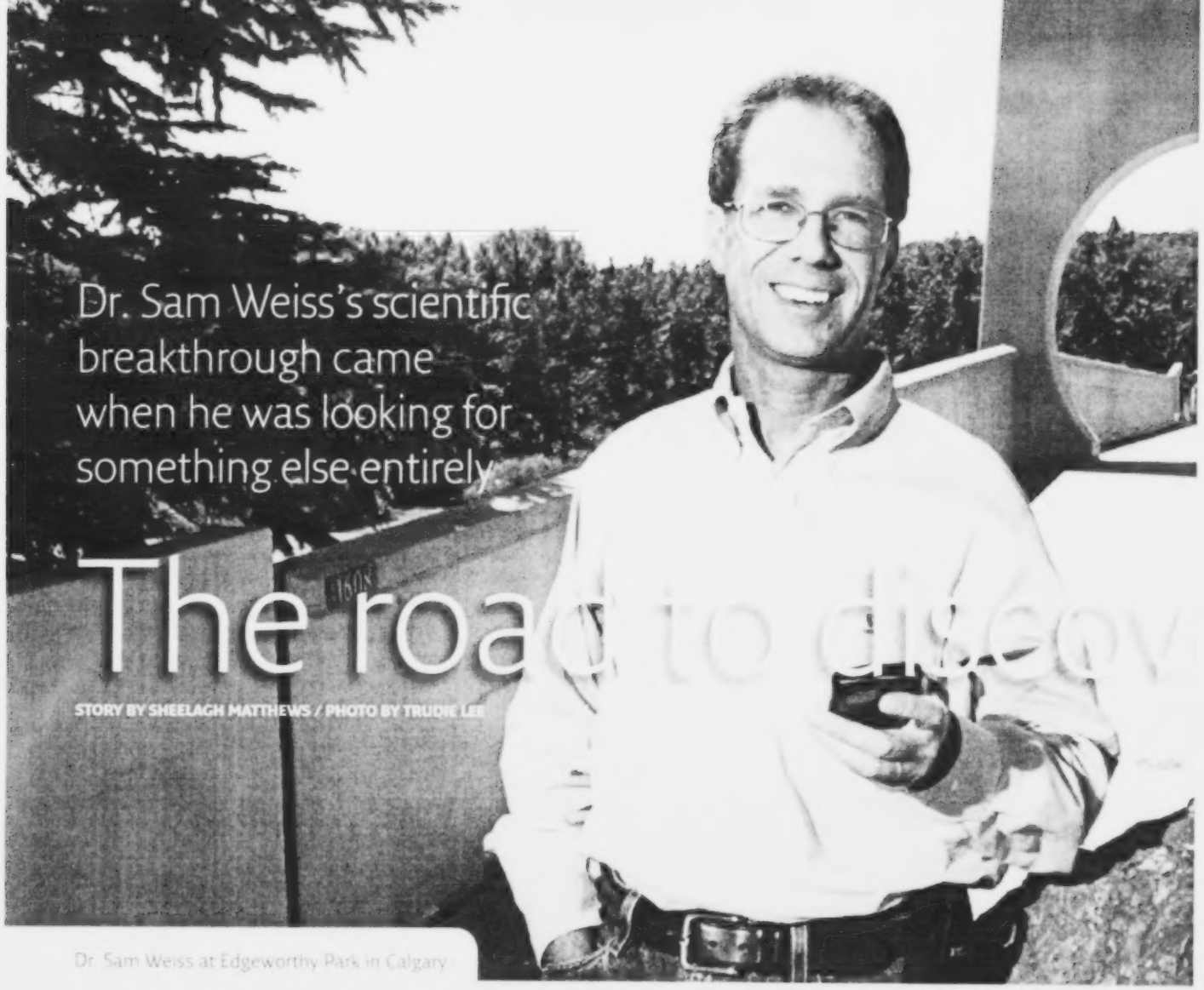
**Selected publication**

Maksymowych WP, Gladman D, Rahman P, Boonen A, Bykerk V, Choquette D, Dimond S, Fortin P, Karsh J, Klinkhoff AV, Mosher D, Mulholland K, Olszynski WP, Russell AS, Savage L, Shanner L, Shojania K, Starr M, Thomson G, Zummer M, Inman R. The Canadian Rheumatology Association/ Spondyloarthritis Research Consortium of Canada treatment recommendations for the management of spondyloarthritis: a national multidisciplinary stakeholder project. *Journal of Rheumatology*. 2007 Nov;34(11):2273-2284.

**Recommended websites**

**To access the online screening questionnaire, go to**
www.arthritisdoctor.ca

**The Arthritis Society**
www.arthritis.ca



Dr. Sam Weiss's scientific breakthrough came when he was looking for something else entirely

# The roa to dis

STORY BY SHEELAGH MATTHEWS / PHOTO BY TRUDIE LEE

Dr. Sam Weiss at Edgeworthy Park in Calgary

Dr. Samuel Weiss went on to become an AHFMR Scientist and a prominent researcher and professor at the University of Calgary's Faculty of Medicine. In April of this year, he was presented with one of the medical community's most coveted prizes, the Gairdner International Award, "for his seminal discovery of adult neural stem cells in the mammalian brain and its importance in nerve cell regeneration." Known as the "Baby Nobel" in medical circles, this annual award recognizes the world's top scientists in medical research.

Everything changed for this scientist back in 1990. While investigating how to use growth factors to protect the brain, Dr. Weiss and his student, Brent Reynolds, stumbled upon what turned out to be neural stem cells—brain cells that could regenerate. At that time the conventional thinking was that once a brain cell was lost, it was gone forever. This new notion of regenerating adult mammalian brain cells would be a tough sell to the medical community.

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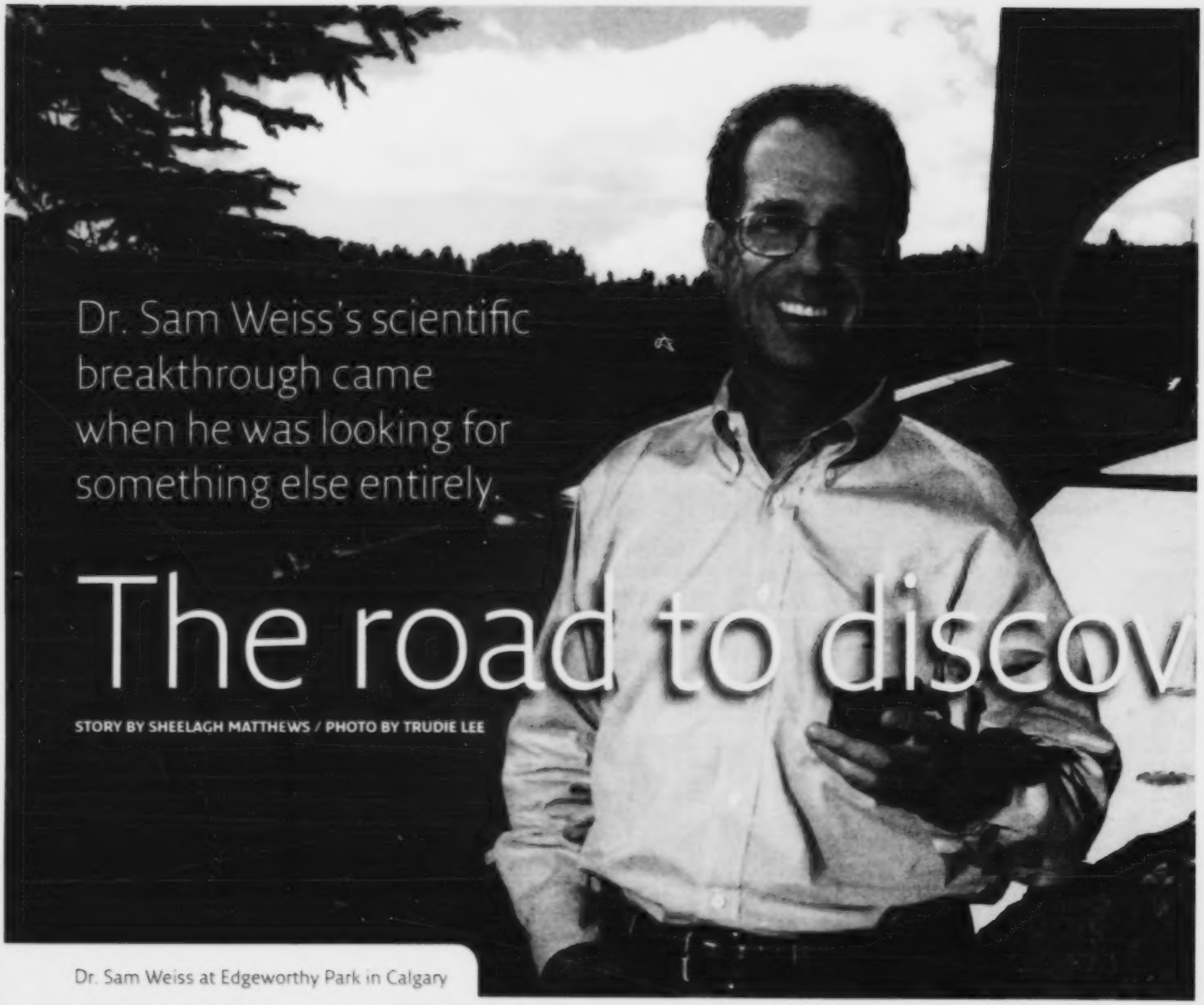
# The road to discov

STORY BY SHEELAGH MATTHEWS / PHOTO BY TRUDIE LEE



Dr. Sam Weiss at Edgeworthy Park in Calgary

BACK IN 1980 a young man from McGill University applied to a newly created medical research foundation for funding to support his research in neuroscience. Sam Weiss was one of the first students funded by AHFMR.

Dr. Samuel Weiss went on to become an AHFMR Scientist and a prominent researcher and professor at the University of Calgary's Faculty of Medicine. In April of this year, he was presented with one of the medical community's most coveted prizes, the Gairdner International Award, "for his seminal discovery of adult neural stem cells in the mammalian brain and its importance in nerve cell regeneration." Known as the "Baby Nobel" in medical circles, this annual award recognizes the world's top scientists in medical research.

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Stem cells in the adult brain could be crucial for treating brain injury

Believe it or not, it was tough to sell to Dr. Weiss, too. It was Reynolds who convinced him that their accidental discovery was worth a second look. Once they had proven that a natural protein could indeed trigger the process of division in adult brain cells, an even bigger question loomed. Could these new brain cells make electrical cells, the kind needed to send electrical transmissions such as response signals to other areas of the brain and body?

The answer was yes, they could. It was a scientific breakthrough, one that went against all previously published and accepted medical dogma. Dr. Weiss recalls, "I can still remember the moment . . . I was thinking, 'This is significant.'"

Going against the belief system of the medical community was no less significant. It took two long years of confirming their findings before *Science* finally published their discovery of neural stem cells in 1992. That's when peers in the medical and research communities began to embrace this new concept.

The implications of this new knowledge for people's quality of life is what Dr. Weiss finds most important. Stem cells in the adult brain could be crucial for treating brain injury or disease. Clinical trials involving stroke patients are underway now, to see if hormones can stimulate adult neural stem cells to grow again after stroke. The concept of using hormones to treat stroke is a direct result of work led by AHFMR Ph.D. student Gloria Mak from Dr. Weiss's lab.

A major new avenue of Dr. Weiss's current research deals with cancerous stem cells, particularly those in the brain. About half of his lab is now dedicated to exploring whether a genetic change in adult stem cells is the root of human brain cancer. To fast-track this type of research, Dr. Weiss and Dr. John Kelly, a young neurosurgery resident and AHFMR Clinical Fellow who leads this effort in the Weiss lab, are busy making as many stem-cell lines for human brain cancer as possible to share with researchers around the world.

"Every minute counts," says Dr. Weiss. "Brain cancer is one of the top two lethal and devastating cancers. These [stem-cell lines] are the type of resources that you have an incredible obligation to share with your colleagues."

Beyond the lab, Dr. Weiss is a strong advocate of funding basic scientific research, not just the kind that we know will be used in the clinic. Firmly of the opinion that advancements in knowledge should not be constrained, Dr. Weiss offers this advice to new researchers: "Be prepared to explore something you weren't looking for; challenge the dogma; don't do the safe experiments; and if you find something interesting, pursue it vigorously." ❋

**About the researcher**

*AHFMR Scientist* and 2008 Gairdner award recipient **Dr. Samuel Weiss** is a professor in the Department of Cell Biology and Anatomy, as well as the Department of Pharmacology and Therapeutics, at the University of Calgary, where he is also the director of the Hotchkiss Brain Institute.

**Selected publications**

Reynolds BA, Weiss S. Generation of neurons and astrocytes from isolated cells of the adult mammalian central nervous system. *Science*. 1992 Mar 27;255(5052):1707-1710.

Mak GK, Enwere EK, Gregg C, Pakarainen T, Poutanen M, Huhtaniemi I, Weiss S. Male pheromone-stimulated neurogenesis in the adult female brain: possible role in mating behavior. *Nature Neuroscience*. 2007 Aug;10(8):1003-1011.

**Recommended website**

**Hotchkiss Brain Institute**

http://www.hbi.ucalgary.ca

# Why not vaccinate?

## An AHFMR Student explores the reasons parents don't immunize their children.

STORY BY TARA NARWANI / PHOTO BY LAUGHING DOG

No parent would want a child to contract diphtheria. The bacterial infection produces a fuzzy grey-black coating in the throat that could cause a child to choke and even die. Fortunately, no one in Canada has died from the disease since 1983 due to the implementation of vaccination programs.

The success of these programs depends, however, on the degree of public support they receive. Registered nurse Shannon MacDonald, an AHFMR-supported Ph.D. student in the Faculty of Nursing at the University of Alberta, is alarmed by recent trends in vaccination rates. For her doctoral work she will examine why certain parents take their children for only some of the recommended vaccinations or do not have them vaccinated at all.

Recent data from the Capital Health area show that only 85% of 2-year-olds have had all of their *DTaP-IPV* shots, the series of injections that includes the vaccine against diphtheria. A coverage rate of 85% might sound high, but it's significantly lower than the 95% level required for a population to achieve "herd immunity".

> If vaccination rates are too low, diseases can reappear, with fatal consequences

*Herd immunity* occurs when immunization levels are so high that there is very little chance that the small portion of the population who are not immunized will come in contact with the disease. Herd immunity prevents an infection from spreading like a chain reaction, and it protects individuals who can't be vaccinated for medical reasons.

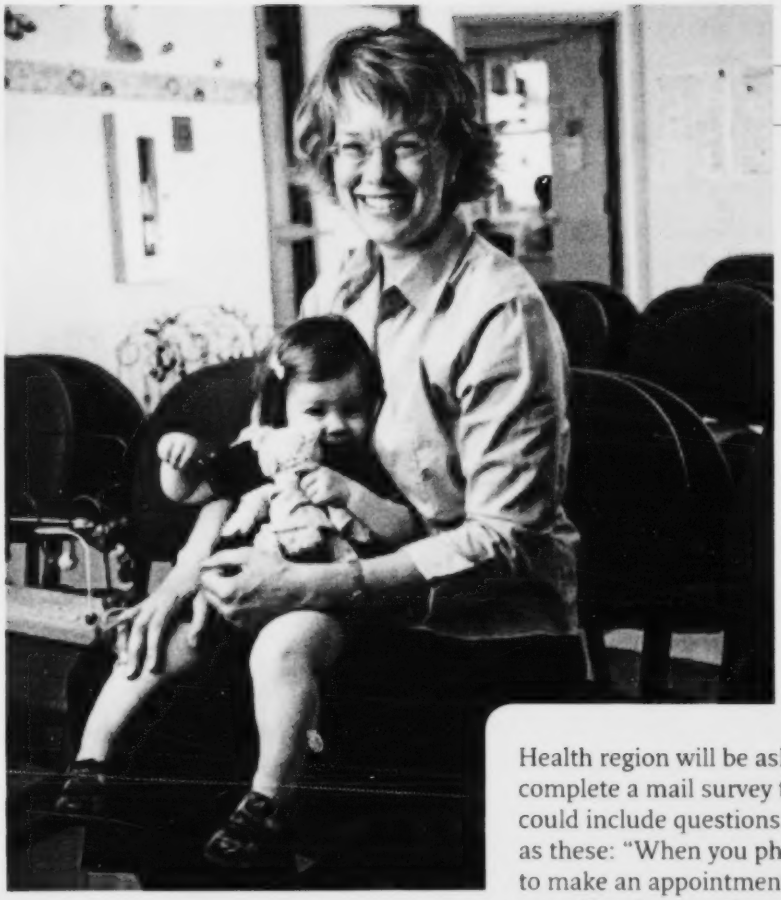
If vaccination rates are too low, diseases that were thought to have been eradicated can reappear, with fatal consequences. "When the former USSR fell apart, so did its public-health system. They had huge outbreaks of diphtheria. In 1989 [prior to the dissolution of the Soviet Union] they had 839 cases of diphtheria; in 1994 [after the country had split] the independent states reported 50,000 cases, and 1700 deaths," MacDonald recounts.

In the Capital Health area, only two of the six routine vaccinations for 2-year-old children have coverage rates that approach 95%. The remaining four range between 84% and 87%. During her clinical work in a pediatric intensive-care unit, Shannon MacDonald saw the very real consequences of decisions not to vaccinate children. "We would see kids, for instance, with *Haemophilus influenzae* type b meningitis because the parents hadn't immunized."

These experiences inspired MacDonald to investigate the factors that influence parents when they're deciding whether or not to complete their children's routine vaccinations.

Previous studies, conducted in the United States, indicate that parents refuse vaccination for their children because of fears around vaccine safety. Certainly there has been considerable debate about whether childhood vaccines can be linked to the incidence of autism, but numerous studies have proven that there is no connection.

MacDonald points out that the US context is very different from that in Alberta and, indeed, in most of Canada. If American parents want to decline vaccinations for their children, they have to take steps to opt out of a mandatory program; and they likely wouldn't expend the effort to



Shannon MacDonald with her daughter Flora at Edmonton's Twin Brooks clinic

do so unless they had strong objections.

In Alberta, where the system is voluntary, she suspects that there are additional factors influencing parental choice. "Is it that parents have beliefs that prevent them from immunizing their children? Is it that they have to take time off work, and they can't afford to do that? Or that they go to the clinic and their healthcare provider is dismissive of their concerns?"

To identify these influencing factors, MacDonald will compare the experiences of parents who completed their children's vaccinations at the two-year mark with those of parents who did not. Parents in the Capital Health region will be asked to complete a mail survey that could include questions such as these: "When you phoned to make an appointment, were you offered a time that was convenient? When you went for the appointment, was the nurse able to answer your questions?

MacDonald's goal is to see vaccination rates increase significantly. In order for this to be achieved, the barriers to vaccination must be correctly identified. ❋

**About the researcher**
**Shannon MacDonald** is an *AHFMR Student* working toward her Ph.D. degree in the Faculty of Nursing at the University of Alberta.

**Recommended website**
**Canadian Coalition for Immunization Awareness and Promotion**
www.immunize.cpha.ca

# AHFMR funding partners

**The Alberta Heritage Foundation for Medical Research** (AHFMR) has committed more than $1 billion to Alberta's health-research community. The Foundation also relies on the contributions of many partners in building and sustaining health research in this province. To mention just a few, these partners include

- the Government of Alberta and its related ministries and programs;
- provincial agencies such as iCORE;
- federal granting agencies such as the Canadian Institutes of Health Research, the Canada Foundation for Innovation, and the Canadian Health Services Research Foundation;
- international funding partners like the Wellcome Trust and the National Institutes of Health; and
- non-profit and voluntary funding agencies such as NeuroScience Canada, the Heart and Stroke Foundation, the Canadian Diabetes Association, and the National Cancer Institute of Canada.

# Following **up**

## Binge drinking among university students

STORY BY JANET HARVEY

Dr. Shervin Vakili

■ BINGE DRINKING is the number one health hazard among post-secondary students in North America. It is defined as drinking an amount that raises the level of alcohol in the blood to 0.08% or above—roughly, five or more drinks in a single session for males, and four or more for females. Binge drinking is associated with a variety of negative consequences, including low marks, accidents, violence, and unwanted or unplanned sex. In 2005, with funding from AHFMR, Dr. Shervin Vakili embarked on a study examining binge drinking among students at the University of Calgary.

He began by surveying 2,500 students about their drinking habits and attitudes. Of those who responded, 63% of males and 55% of females reported they had indulged in binge drinking in the previous month. These percentages are higher than US statistics. Previous research had suggested that binge drinking decreases as students get older. Dr. Vakili's survey found this true of women but less clearly true of men: Although frequent binge drinking decreased over time, occasional binge drinking among male students did not. Over 60% of all students reported negative consequences from their own drinking in the previous month. More surprisingly, a slightly higher percentage reported negative consequences due to someone else's drinking. This finding emphasizes the fact that binge drinking can harm both the drinkers and those around them.

In the second phase of the study, Dr. Vakili is testing a new approach to reduce binge drinking. Every other month, students are sent postcards providing information from the survey—either about their own drinking, or about how much the average University of Calgary student drinks.

This type of corrective information is called *social norming*. The postcards avoid giving out messages about not drinking; they merely provide information and allow students to make their own decisions. Dr. Vakili hopes that this method may be useful as a component of future programs devised to reduce binge drinking.

"Traditional efforts to reduce this problem on campus have not been successful. We need some new answers," he says. "The percentage of binge-drinkers is high. And, sadly, you only have to binge-drink once to experience some potentially devastating and life-altering effects." ❋

**About the researcher**

**Dr. Shervin Vakili** is an adjunct assistant professor in the Department of Psychiatry at the University of Calgary, a psychologist at Calgary Health's Addiction Centre, and a private psychologist in the community. His study on binge drinking was supported through the ***Health Research Fund***, administered by AHFMR on behalf of Alberta Health and Wellness.

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